

Rediscovery and redescription of thread-legged assassin bug *Myiophanes kempi* China, 1924 (Heteroptera, Reduviidae, Emesinae) from caves in the Andaman Island, India

Dhanusha Kawalkar^{1*}, Pooja Patil^{1*}, Hemant V. Ghate², Shirish Manchi¹

1 *Sálim Ali Centre for Ornithology and Natural History (South India Centre of Wildlife Institute of India), Anaikatty (Post), Coimbatore - 641 108, Tamil Nadu, India* **2** *Post-Graduate Research Centre, Department of Zoology, Modern College of Arts, Science and Commerce (Autonomous), Shivaji nagar, Pune - 411 005, Maharashtra, India*

Corresponding author: Shirish Manchi (ediblenest@gmail.com)

Academic editor: Leonardo Latella | Received 2 December 2025 | Accepted 18 February 2026 | Published 5 March 2026

<https://zoobank.org/913F4FF7-9A10-494F-B10C-D54808C847C4>

Citation: Kawalkar D, Patil P, Ghate HV, Manchi S (2026) Rediscovery and redescription of thread-legged assassin bug *Myiophanes kempi* China, 1924 (Heteroptera, Reduviidae, Emesinae) from caves in the Andaman Island, India. Subterranean Biology 55: 77–94. <https://doi.org/10.3897/subtbiol.55.181079>

Abstract

Thread-legged assassin bugs (Emesinae: Reduviidae) are cryptic, slender-bodied predators recognized for their distinctive morphology and varied hunting strategies. Despite their widespread distribution, especially in tropical regions, many species remain poorly studied, particularly those inhabiting subterranean environments. *Myiophanes kempi* China, 1924, a species previously known only from its type locality in the Siju Cave, Assam (now Meghalaya), had not been encountered for a century. During a systematic survey of limestone caves on the Andaman Islands, a tropical archipelago in the Bay of Bengal, two male specimens of *M. kempi* were collected in 2019. The specimens were preserved in ethanol, examined morphologically, and identified using established keys and the original species description. This discovery marks the first record of this bug from the Andaman Islands and confirms existence of *M. kempi* population after 100 years; this extends its known distribution by over 1,000 km southeast of its original locality. The present report provides a redescription of the species, including the first detailed illustrations of the male genitalia. The rediscovery raises intriguing biogeographical questions and emphasizes the ecological importance of caves in the Andaman Islands as a home for this lesser-known assassin bug. This study enhances existing knowledge of cave-dwelling Reduviidae and underscores the significance of cave ecosystems.

* These authors contributed equally to this work.

Keywords

Cave fauna, conservation, subterranean habitat, tropical caves, true bugs

Introduction

Emesinae can be recognized with a set of characters, as stated in Schuh and Weirauch (2020): elongate and slender body, possess forecoxae that are at least 4 times as long as wide, fore acetabulum opening directed anteriorly, ocelli absent with one exception, claws on fore tarsus often unequal and with comb-like teeth or lamellae, mid- and hindlegs thread-like and fossula spongiosa absent on all legs. It is interesting that some of these emesine bugs are cavernicolous, meaning these insects are found in cave environment. Genus *Myiophanes* Reuters, 1881 is one such widely distributed genus (Fig. 1), occurring in Ethiopian, Oriental, Australian, and Palearctic regions, in which many species are found in caves (Wygodzinsky 1966); detailed taxonomic history of this genus, with references from all over the world, has been given by Wang and Rédei (2022) hence only selected references are mentioned here.

The genus is currently subdivided into three subgenera by Wygodzinsky (1966), as discussed earlier (Ghate et al. 2018). The nominotypical subgenus *Myiophanes* s. str., which is mostly Oriental, contains ten described species to date (as listed in Ghate et al. 2018). Of the three species that are known from India, *M. (M.) zebrina* Rédei, 2005 is the most recently described species based on a specimen collected from Bangalore, Karnataka, and preserved in the Natural History Museum (NHM), London (Rédei 2005). *M. (M.) greeni* Distant, 1903, a species originally described from Sri Lanka, was reported from India by Kulkarni and Ghate (2016) while *M. (M.) kemp* China, 1924 (henceforth referred as *M. kemp*, subgeneric name is omitted in all other species mentioned here) is the oldest known species from a former part of Assam (now Meghalaya), India, but is unknown except from type material preserved in NHM, London.

During a survey of Andaman limestone caves two male specimens of *Myiophanes* were collected. The species was subsequently identified as *M. kemp* China, using keys in Wygodzinsky (1966). The original description of *M. kemp*, along with the measurements of some parts (as given by W.E. China, in Kemp 1924), was also consulted. *M. kemp* was described as a new species based on 6 specimens (1 male and 5 females), collected by Kemp, from “Siju Cave, Garo Hills, Assam” (now in Meghalaya). Photographs of one syntype female preserved at NHM, London, kindly shared by Dr. Zuo Chen (China) were further useful to confirm identity. In the footnotes of the same paper China, in Kemp (1924), had pointed out that *M. greeni* that was reported by Paiva (1919) as “collected from Tura, Garo Hills”, is actually *M. kemp*. This fact was overlooked while compiling the ‘Fauna of Meghalaya’ where the same specimen (collected by Mrs. Kemp) was reported again as *M. greeni* (Biswas and Ghosh 1998); the same error was repeated in the recent catalogue of Reduviidae of India by Mukherjee et al. (2020) even though Ambrose (2006) had correctly shown Paiva’s record of *M. greeni* to be actually of *M. kemp*. *Myiophanes kemp* has not been collected / reported again

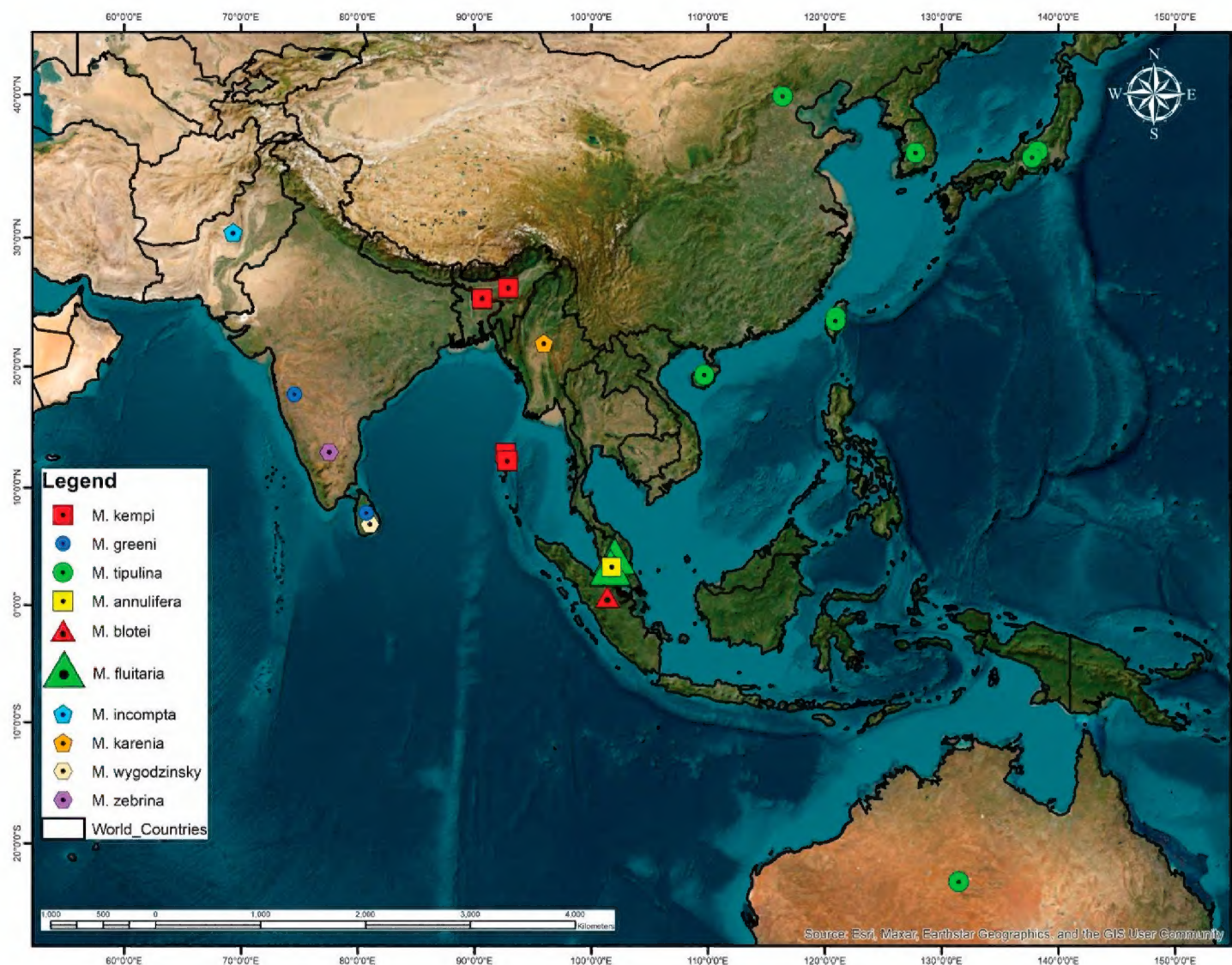


Figure 1. The global distribution of the Genus *Myiophanes* (*Myiophanes*) Reuter.

during the past 100 years now. Harries et al. (2021), who recently studied the biota of Siju Cave during a short visit, in February 2019, also did not find any specimen.

Hence, the basic aim of this paper is illustrated redescription of *M. kempi*, as the species has neither being found in the past 100 years nor illustrated ever before. Diagnostic as well as detailed characters of the genus *Myiophanes* have already been published before (see Wygodzinsky, 1966; Rédei 2005) hence not reiterated here.

Material and methods

Study area

The study was conducted in the tropical caves of the Baratang Island (Fig. 2; 12°05'N, 92°45'E), harbouring the most significant known cave complex on the islands. Baratang cave complex is located within 0.77 km² between Wraffter's Creek and Naya Dera, including more than 175 limestone caves (Sankaran 2001; Manchi and Sankaran 2014; Mane et al. 2019). The area is a Reserve Forest and is protected under the Indian Forest Act 1927. The most dominant vegetation types in this karstland forest are Andaman

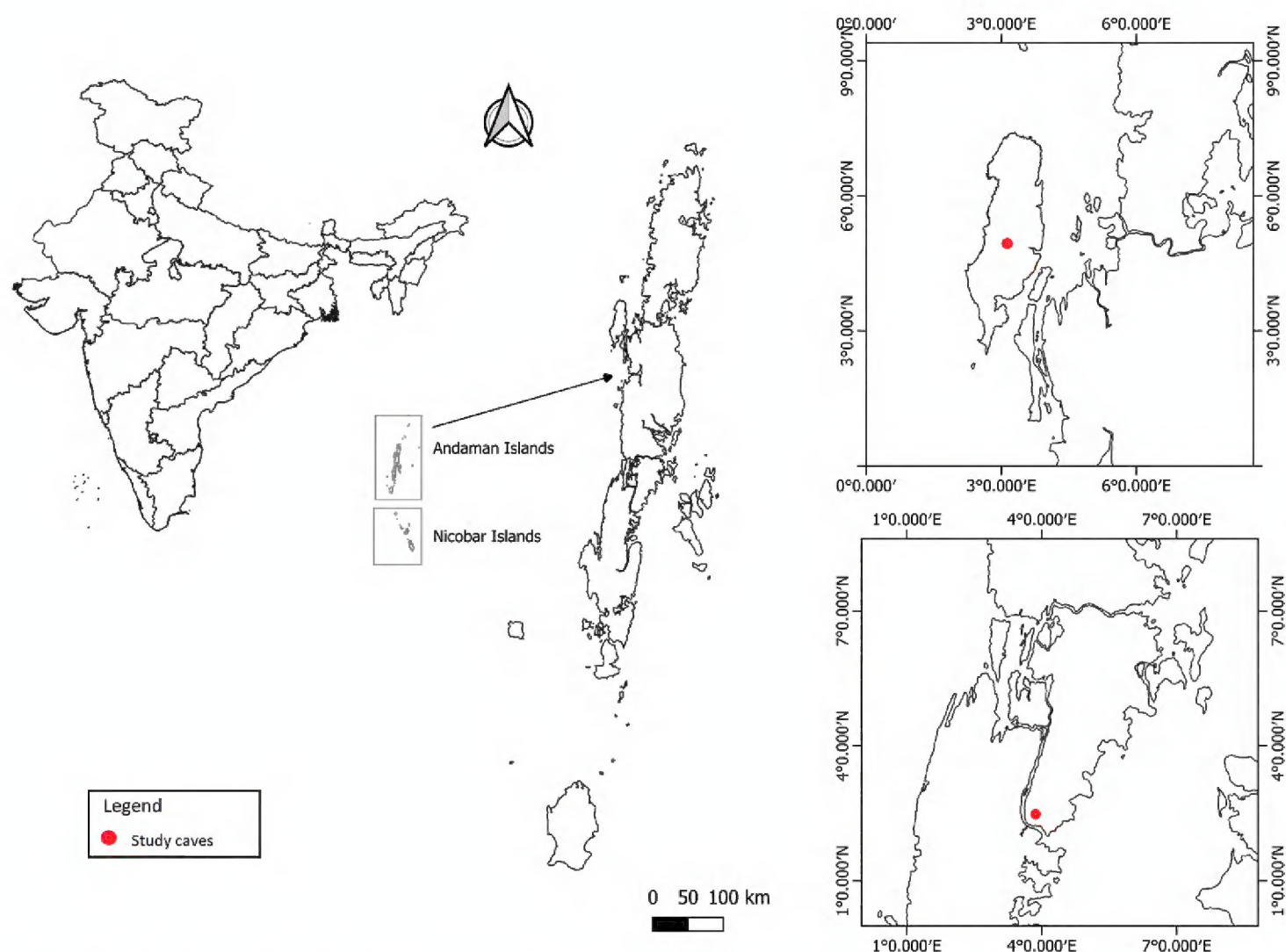


Figure 2. The geographical location of the study caves in Baratang and Interview Islands in Andaman and Nicobar archipelago.

tropical evergreen forest, Andaman semi-evergreen forest, littoral forest, and mangrove forest (Champion and Seth 2005), with exclusive diversity patterns (Mane et al. 2019).

Interview Island (Fig. 2; 12°53'N, 92°40'E), the westernmost island of the Middle Andaman group, is the largest Wildlife Sanctuary (133.40 km²) in the archipelago (Murthy, 2007). This recently described simple carbonate island is known to have 35 limestone caves (Sankaran 2001; Manchi and Mane 2012, Kawalkar and Manchi 2020). This uninhabited island has four major types of forests: Tropical Evergreen Forest, Andaman Semi-Evergreen Forest, Littoral Forest, and Mangrove Forest (Champion and Seth 2005). It also has a rich faunal diversity (Pande et al. 1991).

Material examined

The specimens were collected by the team comprising Manchi Shirish, Prathamesh Gurjarpadhye, Dhanusha Kawalkar, Amruta Dhamorikar, and Justin Sumit Kumar as part of the then ongoing project (2017–2020) of the *In-situ* and *Ex-situ* conservation of the Edible-nest Swiftlet (*Aerodramus fuciphagus*) in the Andaman Islands. While conducting a systematic faunal survey (Dhamorikar et al. 2020; Kawalkar et al. 2022) inside the caves, the specimens were collected from Baratang and Interview Island on the 16/02/2019 and 13/01/2019 respectively. The samples were carefully preserved in 100% alcohol. Further, the specimens were stored at the SACON facility and later

examined and identified as males of *Myiophanes kemp*. Further, we followed Boyane and Ghate (2020) for the photographic documentation, measurements and dissection process. The specimens will be deposited in Zoological Survey of India, Pune.

Comments on habitat: The first bug was collected in pre-monsoon season of 2019, from a cave (Fig. 3a) on Baratang Island. The horizontal limestone cave measures 21.1 meters in length and is oriented in a northwest direction. This cave has a single opening, a clearly defined entrance, and distinct zonation: the entrance zone (1–8 meters), the twilight zone (8–13 meters), and the dark zone (14–22 meters). The entrance and twilight zones are

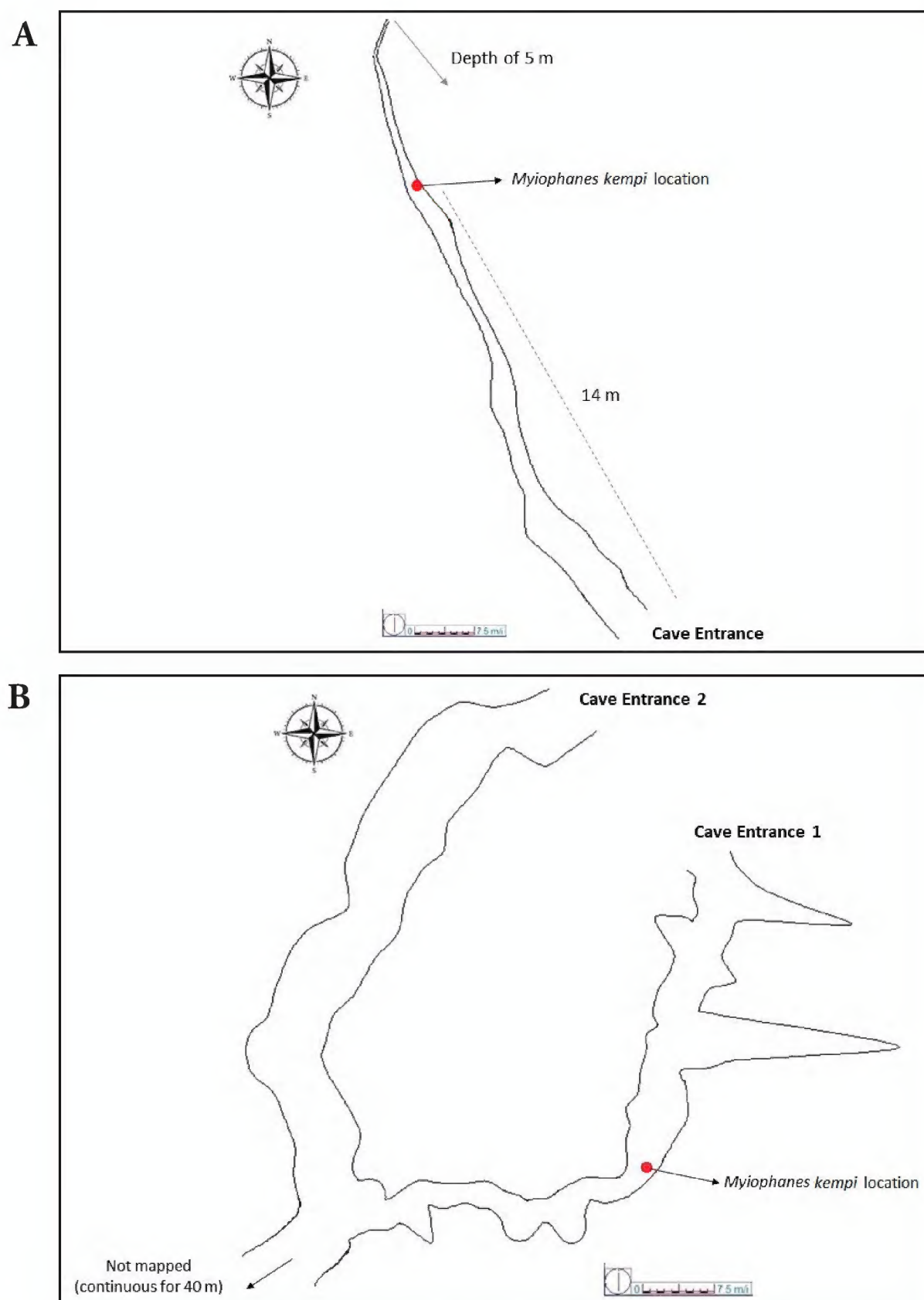


Figure 3. The location map of the *Myiophanes* inside the cave at **a** Baratang Island, North and Middle Andaman Islands, and **b** Interview Island, North and Middle Andaman Islands.

characterized by speleothems, boulders on the ground, and soil, transitioning to substrate mixed with edible-nest swiftlet guano in the dark zone. The sample was collected from the right wall surface, approximately 14 meters from the entrance, within the dark zone. This point marks the confluence of the twilight and dark zones as per the mapped cave transect. The individual was observed in the crevices around 2 meters above the ground.

The other sample was collected from a cave (Fig. 3b) on Interview Island. It is a horizontal cave measuring 89.4 meters in length. This horizontal cave is multi-chambered and oriented in a North–northeast to South–southwest (NNE–SSW). It has two openings, with a clear distinction between zones. The cave serves as a habitat for both the swiftlets and bats. This sample was collected from the wall in the dark zone of the cave (Fig. 3b).

Results

Taxonomy

Myiophanes Reuter, 1881: 337

Type species. By monotypy: *Myiophanes tipulina* Reuter, 1881.

Myiophanes: Distant (1903: 201 key, 204 diagnosis), Kemp (1924: 96), McAtee and Malloch (1926:118, 135 brief diagnosis, new species descriptions); Wygodzinsky (1966: 270, 271, 274) (diagnosis, keys for the subgenera and included species, distribution), Maldonado Capriles (1990: 88–90) (catalogue), Rédei (2005: 24) (list and distribution of subgenus *Myiophanes* and description of two new Indomalayan species). Ghate, Kulkarni and Benjamin (2018:237 new species description and list of species in the Oriental region), Wang and Rédei (2022).

Myiophanes kemp China, 1924 (In: Kemp 1924)

Type material. China in Kemp (1924:96 original description), Wygodzinsky (1966:273, key, listed), Maldonado-Capriles (1990:89 catalogued), Rédei (2005:24 listed), Ghate et al. (2018:237, 244 listed), Harries et al. (2020:125 mentioned absence in Siju cave survey).

Redescription. Medium sized, elongate, macropterous emesine bug of about 20 mm total length. Pronotum, fore legs and abdomen with contrasting colour markings. Body pilose.

Colouration and vestiture: Body in general of light colour, dull, with some pattern of dark areas, as illustrated in Figs 4–6. Forewings translucent pale brown, veins dark brown (Fig. 8a).

Entire body, except wings, covered with short adpressed setae and long, often curved ‘hairs’ which are dark brown, pale brown or white depending on colour of body in that area. Mid- and hind legs are more pilose than rest parts.



Figure 4. *Myiophanes kempi*, dorsal habitus.

Structure: Head elongate fusiform, almost as long as anterior lobe of pronotum; anteocular slightly longer than postocular, clypeus slightly raised above level of mandibular plates. Eyes large, globular but not reaching dorsal or ventral margin of head in lateral view; interocular furrow oblique, situated closer to posterior border of eye, and surpassing it posteriorly, deep. Labium with first two visible (actual II and III) labiomeres or segments stout, third visible (actual IV labiomere) slender; strongly bent between visible first and second labiomeres, second visible reaching middle of eye as seen laterally (Figs 5c, d, 6b). Antennae inserted at middle of anteocular region, with first two segments very long, third and fourth short and slender, third shortest.

Pronotum completely covering mesonotum, anterior lobe wide behind head and strongly narrowed, almost parallel sided in posterior half; posterior lobe bell-shaped, its posterior margin elevated and slightly emarginate in middle (Figs 5a, b, 6).

Fore legs slender considering size of insect, with usual two series of spiniferous processes on ventral side of femur: anteroventral (AVS) and posteroventral (PVS) series. PVS beginning close to base of femur, with 10 long (almost as long as width of femur) spiniferous processes with their bases as long as setae and several medium and small processes in be-

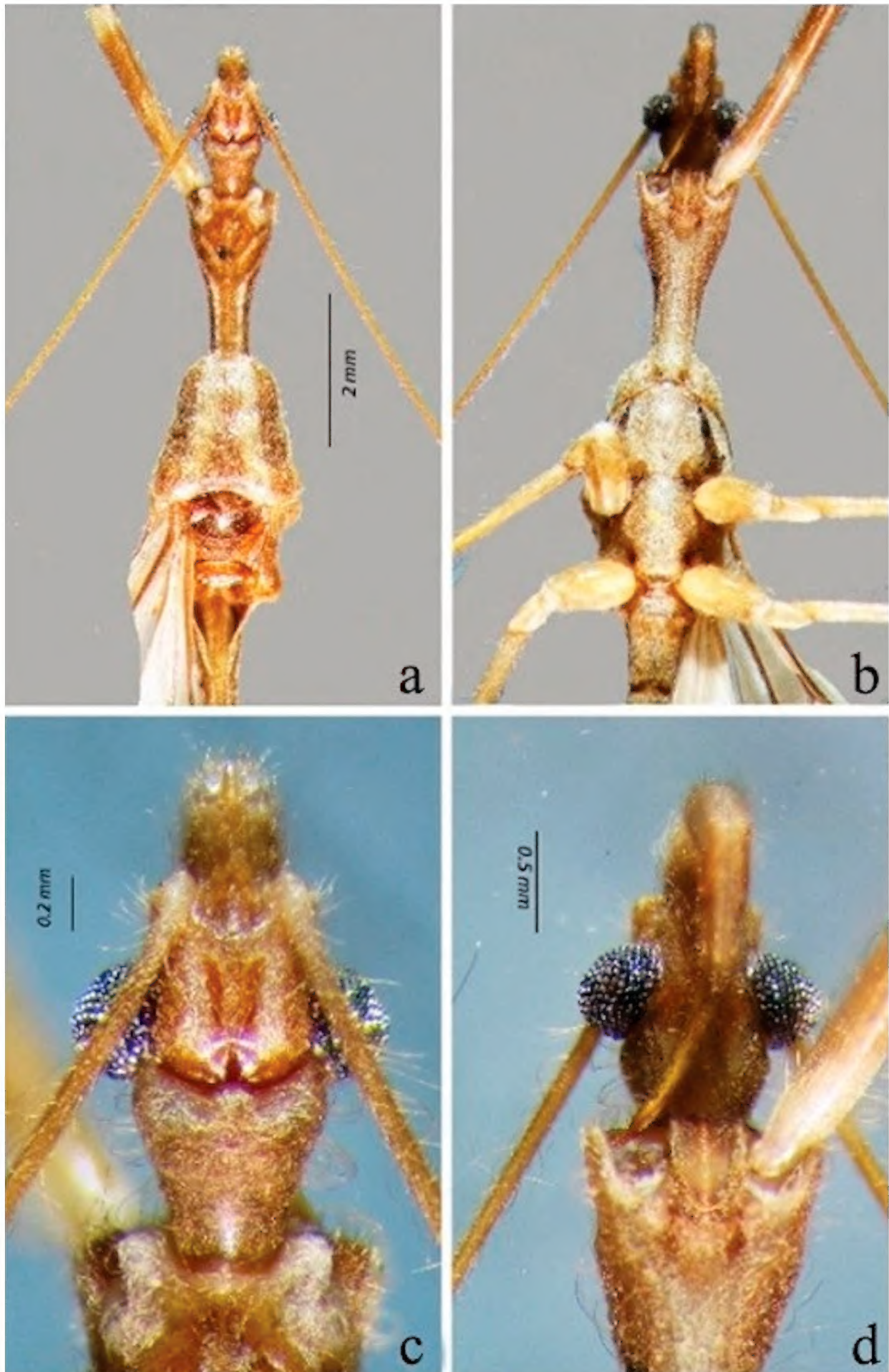


Figure 5. a–d *Myiophanes kempi* structure **a, b** dorsal and ventral view of head and thorax **c, d** dorsal and ventral view of head.

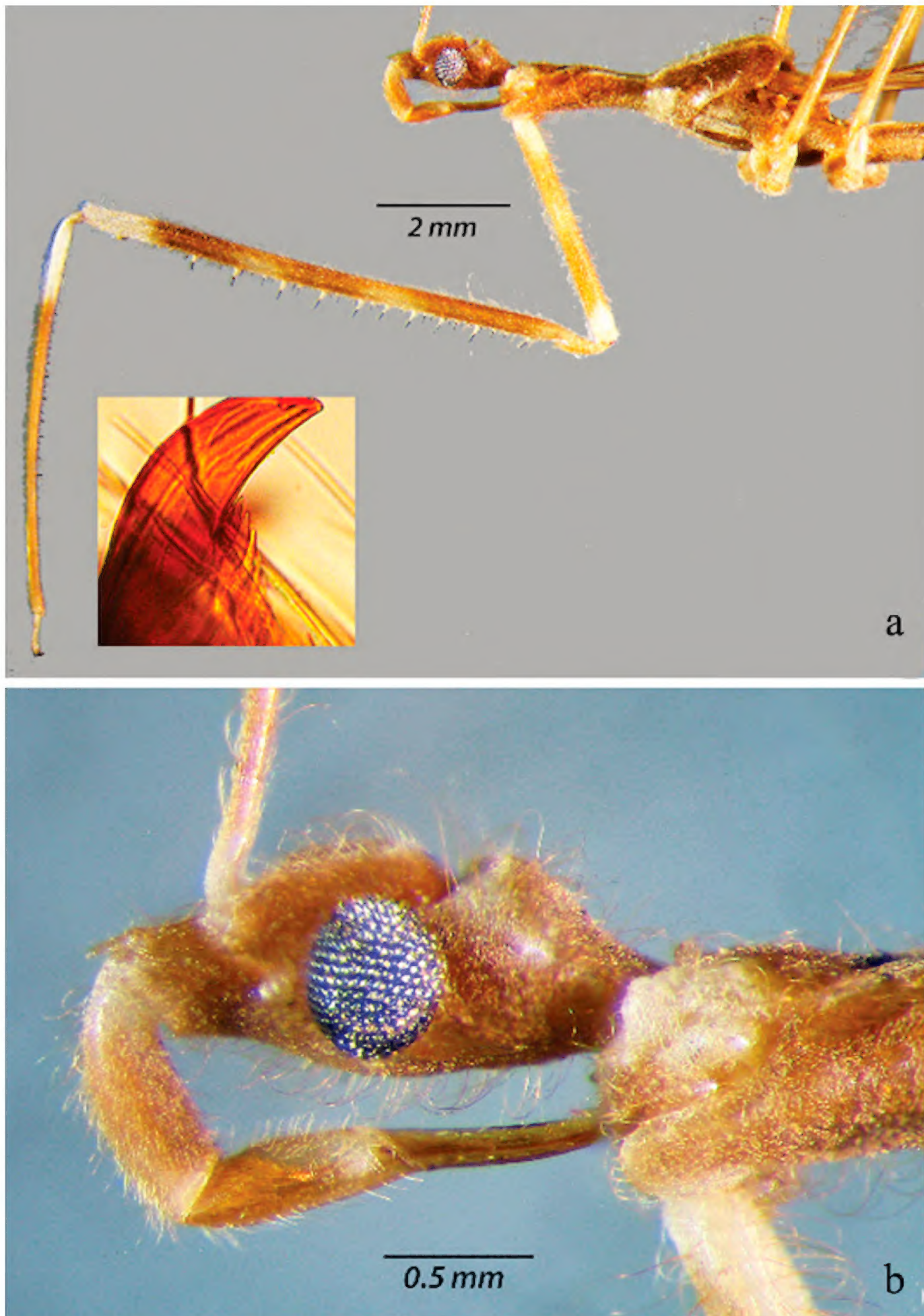


Figure 6. *Myiophanes kempi*, structure **a** lateral view of anterior half of body- inset claw structure **b** lateral view of head.

tween long processes; AVS beginning slightly in front of first PVS process, not interrupted, with many medium and short spiniferous processes, none as long as any PVS process. Fore tibia shorter than femur, slightly curved, with one series of small but robust spiniferous se-

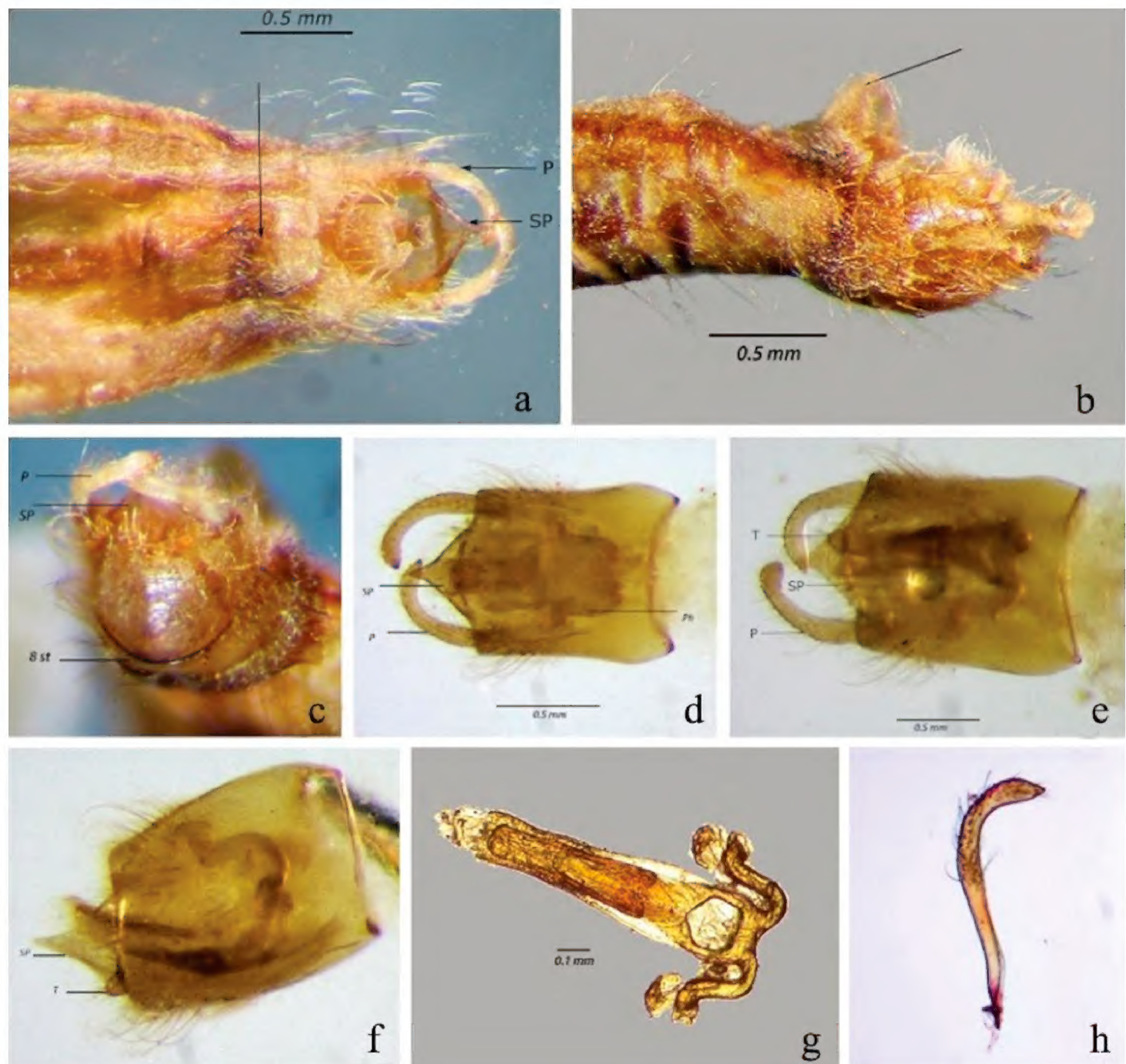


Figure 7. a–h *Myiophanes kempfi*, male genitalia. **a** dorsal view of tip of abdomen; **b** lateral view of abdomen **c** posterior view of abdomen tip **d–f** dorsal, ventral and lateral views of pygophore after KOH treatment **g** phallus in dorsal view **h** paramere.

tae. Fore tarsus very short, about one-tenth of tibia, three segmented; claws unequal, outer one with 6 short comb-like, sub-basal processes (Figs 6a, b, 8b, c). Mid- and hind legs thin, long, their tarsi short, three segmented; claws very small, delicate, curved.

Forewings broad, passing beyond apex of abdomen, with sub-basal cell and with free vein emanating from Cu (Fig. 8).

Abdomen slender, almost parallel sided, slightly dilated in genital region. In male seventh tergite slightly raised above in middle; eighth segment visible from lateral as well as ventral side. Pygophore cup like, convex ventrally, not covered over dorsally, somewhat longer than high, with sharp superoposterior spine, this spine is surrounded on its sides by curved, criss-crossing parameres (Fig. 7a–c) Superoposterior spine appears to originate from inner surface of posterior wall of pygophore; in addition, a blunt tubercle at base of long spine becomes visible after

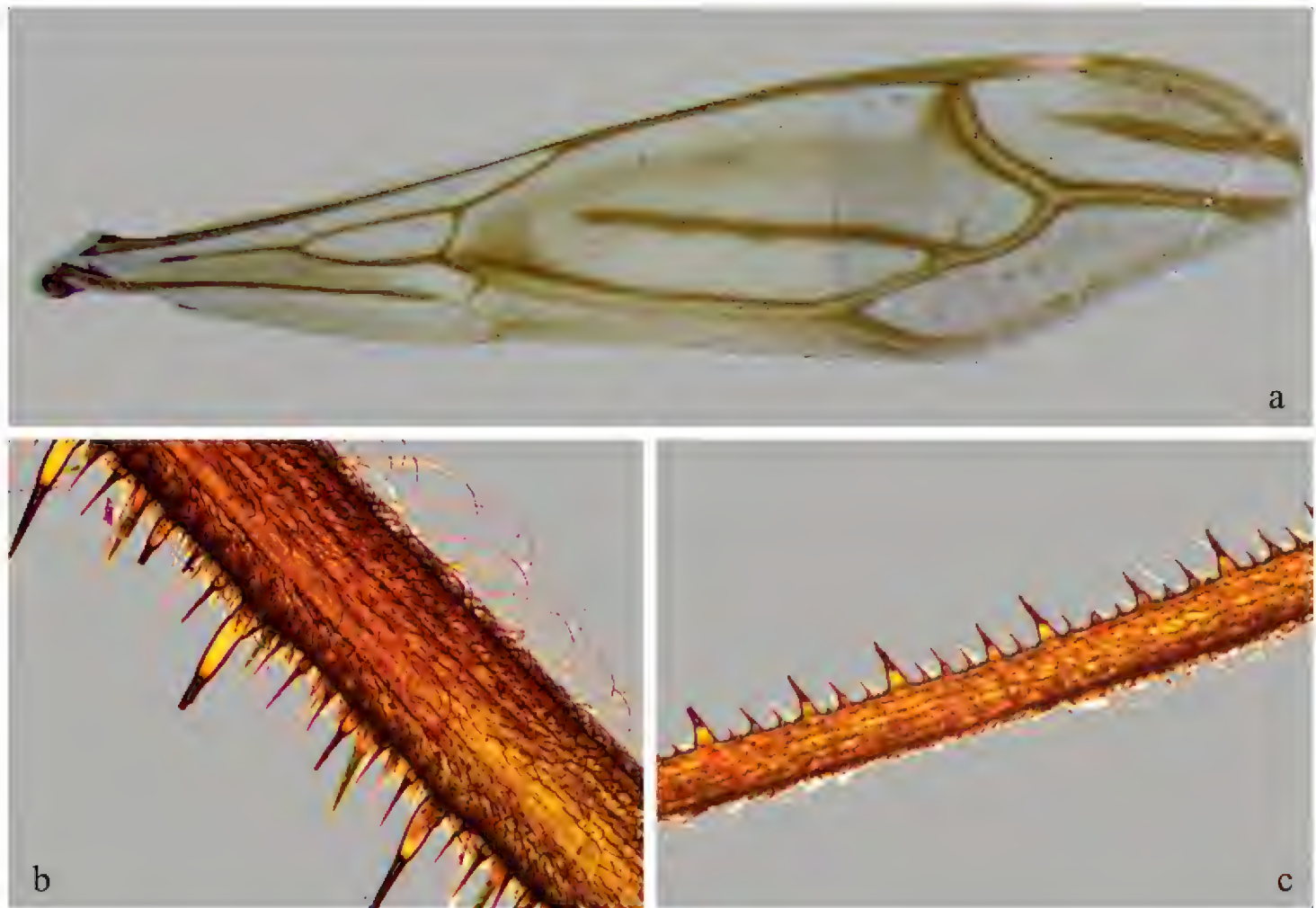


Figure 8. *Myiophanes kemp* structure **a** forewing **b** femoral spiniferous processes **c** tibial spiniferous processes.

KOH treatment (Fig. 7d–f). Uneverted phallus symmetrical, with stout articulatory apparatus; phallosoma narrow, slightly broad at base and narrowed apically, more sclerotized in distal half. Endosoma appears simple, membranous, with some granular area near apex (Fig. 7g). Parameres curved in distal third, pointed at apex, with long setae in distal half (Fig. 7h).

Images of syntype / allotype female of this species, which is preserved at NHM, London, are also presented here (Fig. 9).

Measurements. Based on one male; all measurements are in mm.

Total body length from apex of head to tip of forewing 18.5.

Head: total head length laterally (including ‘neck’) 1.95, length of anteocular region 0.8, of postocular region 0.5, eye diameter 0.5, head width dorsally 1.2, interocular distance 0.6.

Antenna: length of scape 12.5, pedicel 12.5, basiflagellomere 1.1, distiflagellomere 2.0.

Labium: length of visible labiomere I 0.75, of visible labiomere II 0.6, of visible labiomere III 0.8.

Pronotum: dorso-median length 4.0 (2.1 ant. lobe + 1.9 post. lobe), width at anterior angles 0.85, minimum width 0.55, width at humeral angles 2.0; forewing length 14.0.

Legs: fore leg- length of coxa 3.75, of femur 8.0, of tibia 6.2, of tarsus with claw 0.65; mid leg- length of coxa 0.85, of femur 14.50, of tibia 24.0, of tarsus with claw 0.55; hind leg- length of coxa 0.85, of femur 20.0, of tibia 30.5, of tarsus with claw 0.55.

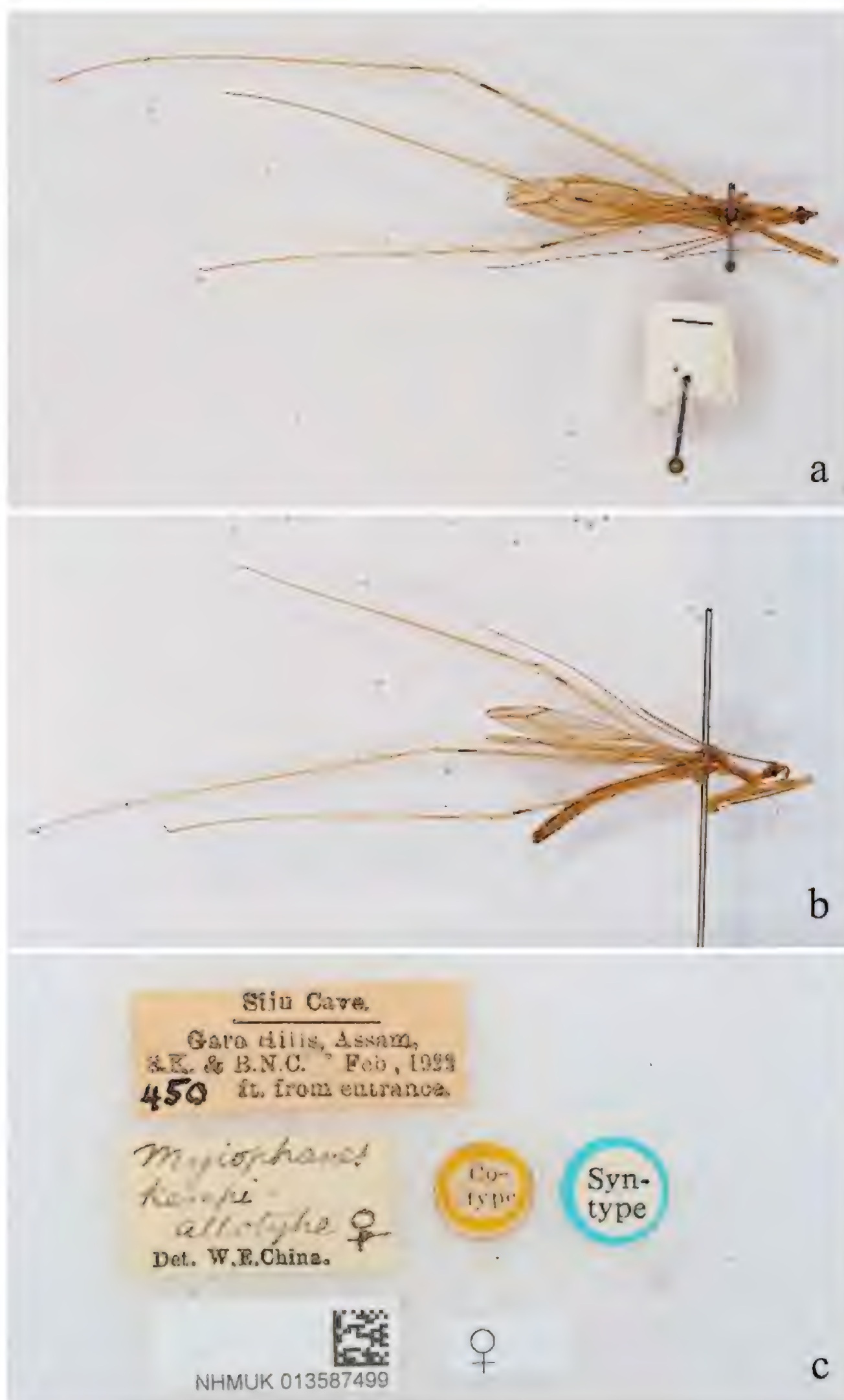


Figure 9. *Myiophanes kempii* allotype female from NHM, London. **a** (top) dorsal habitus **b** (middle) lateral view **c** (bottom) label data. © NHM, London and Dr. Zhuo Chen.

Some important proportions of body are: head almost as long as anterior lobe of pronotum; anterior and posterior lobes of pronotum are equal in length; overall pronotum is twice as long as wide at humeral angles; antennae much longer than body; first and second antennomeres are of equal length.

Discussion

The material at hand matches well with the original description of *M. kempi*, which is mostly about colouration and includes a few measurements. Our specimen appears to have somewhat longer mid and hind legs than the single male measurements given by China (in: Kemp 1924). Colouration of abdomen also seems somewhat variable as in one male the abdomen is blackish above and irregularly speckled with black ventrally, as described by China, but the second male has midventral and lateral black lines and this is actually very similar to abdominal colouration of female syntype; head and pronotal colouration, as well as fore leg and forewing venation and colouration, is also matching with that of the female syntype (image kindly provided by Zhuo Chen, China Agricultural University, Beijing, China), though the syntype has faded over the years of preservation (date of collection of syntype is Feb 1922, as per label data). The other images of male syntype (kindly provided by Diana Isabel Rendón-Mera, NHM, London, but not added here) are of a poorly preserved, dissected male specimen and has also much faded, even then the abdomen is much dark in this male. The original description of this species was not accompanied by any illustrations so these images of syntype are the only available illustrations for comparison.

Myiophanes species are relatively large and conspicuous emesine bugs, yet only a few species have been described in the past several decades. Conspicuously coloured *M. greeni*, although described from Sri Lanka in 1903, was always likely to be present in India (because India shares many faunal elements with Sri Lanka), but was not recorded from India for over 100 years since original description, until its report from a cave in Satara, Maharashtra (Kulkarni and Ghate 2016). Same is the case with some other emesines which were originally described from Sri Lanka but we recently reported those from India, indicating lack of surveys / expertise (Hiremath et al. 2022; Ranasinghe et al. 2024; Sankararaman et al. 2024) and general disregard for insects in biodiversity assessments. Were those species already present in India at the time when those were originally described from Sri Lanka or those have recently dispersed to India, either on their own or by humans, remains unknown.

Caves always harbour interesting animals, some of which are adapted for special life, yet studies on cave fauna are also far from complete as far as insect fauna is concerned. Although some species of emesines are found in caves, none are specially adapted for cave life or show features of true cave animals (like loss of pigmentation and eyes) or are dependent on cave environments, as discussed by Wygodzinsky (1966). *M. kempi* was also originally described from Siju Cave but subsequent specimen from Tura was found in the open – it is the same Tura specimen which Paiva

(1919), incorrectly reported as *M. greeni*. *M. wygodzinskyi* Ghate, Kulkarni & Benjamin, 2018 is also noted within and outside the cave environs (T. Ranasinghe, Sri Lanka, personal communication, Ghate et al. 2018).

All other species of *Myiophanes* from the Oriental region can also be easily differentiated from *M.(M.) kempfi*: for example, *Myiophanes fluitaria* McAtee & Malloch, 1926 (larger species with body length: 23 mm) and *M. annulifera* McAtee & Malloch, 1926 (smaller species with body length: 15 mm), both described from the Malay Peninsula, have different shape of pronotum and a markedly different forewing colouration; *M. annulifera* also has pronounced rounded elevation on head behind transverse sulcus. *M. karenia* Distant, 1903 is a smaller species with different forewing colouration. *M. tipulina* also has a very different colouration, is a small species and has markedly different pronotum shape, as illustrated by Wang and Rédei (2022). Both *M. zebrina* and *M. incompta* also possess pronotum that is very different in shape and proportions and also have much smaller head. *M. kempfi* has much longer head and ‘neck’ and the shape of pronotum is very unique. Another interesting and diagnostic feature in *M. kempfi* is the lack of transverse, black annuli on abdomen which are so well observed in *M. zebrina*, *M. incompta*, *M. greeni* and *M. wygodzinskyi* (Rédei 2005; Kulkarni and Ghate 2016; Ghate et al. 2018). Pronotum with its anterior lobe as long as head is also a character that distinguishes this species easily.

As far as the structure of pygophore is concerned, the statement in the original description by China “...genital segment with 3 pale yellow styles strongly curved and almost contiguous at their apices....” actually refers to the two curved parameres around a median pygophoral spine or so called superoposterior spine (see Fig. 7c): actually, similar description was given by Reuter (1881) while describing *M. tipulina*; and similar appearance of male genitalia (pygophore) is also seen in other *Myiophanes* (McAtee and Malloch 1926; Wygodzinsky 1966; Rédei 2005; Kulkarni and Ghate 2016). But in *M. kempfi* another unique feature appears to be the presence of an additional tubercle at base of superoposterior spine of pygophore and this fact has also been observed by Dr. Zhuo Chen who studied the dissected pygophore of the syntype male deposited in NHM, only the outer spine appears larger in type (personal communication with Dr. Zhuo Chen). It is likely that the length of this second spine is variable or it is damaged in our specimens. It is important to note that this feature of pygophore has not been described in any other males of this Oriental subgenus at least.

Another interesting aspect is the rediscovery of this species, after 100 years, at a place hundreds of kilometres southeast, in totally new environs of Andaman Island. Geologically, the Andaman–Nicobar archipelago is the emergent part of a long ridge which extends from the Arakan–Yoma ranges of western Myanmar (former Burma) in the north to Sumatra in the south and it is situated about 1200 km southeast of mainland India (Bandopadhyay and Carter 2017). Is the presence of this species in Andaman a result of transport due to human agency or is it part of native population?. More faunistic surveys are essential to check if any other insects

/ invertebrates found in the caves of North-eastern part of India are also present in Andaman. Some species of Emesinae are very widely distributed but it is uncertain if it is a natural or human-caused distribution; Emesinae are having unusually high spreading potential (see Wygodzinsky 1966).

Finding *M. kempi* in Andaman becomes all the more significant because a recent survey of Siju Cave (Harries et al. 2020) failed to recover both the emesines [*M. kempi* and *Bagauda cavernicola* Paiva, 1919 = *Pleias cavernicola* (Paiva, 1919) as per revised nomenclature given by Chen et al. 2025] reported earlier from that cave. So far *P. cavernicola* has not been collected from Andaman Caves but we have recently collected similar specimens (Dec 2025/Jan 2026) that are being studied currently.

Since no diagrams or photos accompanied the original description of this species, this becomes the first illustrated account of *M. kempi*. Further, information on genitalia provided here is addition to the knowledge about this species.

Subterranean caves are island-like habitats that support distinct ecosystems composed of communities of highly specialised organisms (Howarth 2009). Although caves provide suitable habitats for the Emesinae bugs, limited information is available on their ecology (Bernardi et al. 2020). However, many studies have attributed their presence inside caves to prey availability (Wygodzinsky 1966; Ghate et al. 2018; Bernardi et al. 2020). Given that assassin bugs are known to be cave-dwelling and supported by cave habitats, it would be interesting to understand their ecology, life history, feeding behaviour, and their precise role within the cave food web. Systematic studies to document diversity are recommended to highlight the importance of cave habitats for assassin bugs and other invertebrates in the Andaman Islands. This will also help strategize their conservation priority and promote the protection of these caves.

Acknowledgements

We are thankful to the Ministry of Environment, Forests and Climate Change (MoEFCC) for funding the Edible-nest Swiftlet conservation project under which the specimens were collected. We are also grateful to the Department of Environment and Forests, Andaman and Nicobar Islands for the permissions to conduct this study and collecting specimens. We are also thankful to The Habitats Trust (THT) for supporting the ongoing project aiming to conserve the overlooked subterranean cave habitat in the Andaman Islands, which helped to assess the specimens and identify them. We are especially indebted to Dr. Zhuo Chen (China) and Ms. Diana Rendón-Mera (NHM, London) for providing images of the syntypes; Zhuo Chen also critically read the first draft of this paper and suggested improvements. We are indebted to the authorities of Modern College, Pune, Maharashtra, for providing us with the facilities and encouragement. We are thankful to Pratik Pansare for preparing the global distribution map (Fig. 1). Finally, we are grateful to Amruta Dhamorikar, Prathamesh Gurjarpadhye, Justin Sumit Kumar, Santial Toppo, and Saw Safarmi for their support during field work.

References

- Ambrose DP (2006) A checklist of Indian assassin bugs (Insecta: Hemiptera: Reduviidae) with taxonomic status, distribution and diagnostic morphological characteristics. *Zoos' Print Journal* 21(9): 2388–2406. <https://doi.org/10.11609/JoTT.ZPJ.871.2388-406>
- Bandopadhyay PC, Carter A (2017) Introduction to the geography and geomorphology of the Andaman–Nicobar Islands. In: *The Andaman–Nicobar Accretionary Ridge: Geology, Tectonics and Hazards*. Geological Society, London, Memoirs 47: 9–18. <https://doi.org/10.1144/M47.2>
- Bernardi LFO, da Fontoura Sperandei V, Audino LD, Sena CH, Alves JA (2020) Notes on the predation of an assassin bug by a spider in a Neotropical cave. *Subterranean Biology* 33: 17–22. <https://doi.org/10.3897/subtbiol.33.48292>
- Biswas B, Ghosh LK (1998) Insecta: Hemiptera: Heteroptera: Reduviidae. In: *State Fauna Series 4: Fauna of Meghalaya, Part 4*. Zoological Survey of India, Kolkata, 291–330.
- Boyane SS, Ghate HV (2020) Redescription of *Ploiaria mellea* (Heteroptera: Reduviidae: Emesinae) and its first report from India. *Zootaxa* 4729(4): 595–600. <https://doi.org/10.11646/zootaxa.4729.4.11>
- Champion HG, Seth SK (2005) *A revised survey of the forest types of India*. Natraj Publishers, Dehradun.
- Chen Z, Li H, Cai W (2025) A review on the nomenclature and taxonomy of the Old World thread-legged bug genus *Pleias* (Hemiptera: Reduviidae: Emesinae). *Insects* 16(1): 70. <https://doi.org/10.3390/insects16010070>
- Dhamorikar A, Kawalkar D, Manchi S (2020) Distribution of crickets (Subfamily: Phalangopsinae) in caves of Baratang Island, Andaman and Nicobar Islands, India. *International Journal of Speleology* 49(3): 221–228. <https://doi.org/10.5038/1827-806X.49.3.2341>
- Distant WL (1903) *Rhynchota*. Vol. II (Heteroptera), Part 1. In: Blanford WT (Ed.) *The Fauna of British India, Including Ceylon and Burma*. Taylor & Francis, London, 242 pp. <https://doi.org/10.5962/bhl.title.48423>
- Ghate HV, Kulkarni S, Benjamin SP (2018) Giant assassin in the cave: a new species of the genus *Myiophanes* from Sri Lanka (Hemiptera: Heteroptera: Reduviidae: Emesinae). *Zootaxa* 4524(2): 237–244. <https://doi.org/10.11646/zootaxa.4524.2.7>
- Harries D, Kharkongor IJ, Saikia U (2020) The biota of Siju Cave, Meghalaya, India: A comparison of biological records from 1922 and from 2019. *Cave and Karst Science* 47(3): 119–130.
- Harries D, Kharkongor IJ, Saikia U (2021) The biota of Siju Cave, Meghalaya, India: a comparison of biological records from 1922 and 2019. *Cave and Karst Science* 47(3): 119–130.
- Hiremath SR, Saikia S, Ghate HV (2022) Authentic report of the emesine bug *Gardena melinarthrum* Dohrn, 1860 (Hemiptera: Heteroptera: Reduviidae) from India. *Journal of Threatened Taxa* 14(6): 21296–21301. <https://doi.org/10.11609/jott.7902.14.6.21296-21301>
- Howarth FG (2009) Cave insects. In: Resh VH, Cardé RT (Eds) *Encyclopedia of Insects*, 2nd edn. Academic Press, 139–143. <https://doi.org/10.1016/B978-0-12-374144-8.00047-3>
- Kawalkar D, Dhamorikar A, Manchi S (2022) Population distribution and habitat occupancy of spiders (Order: Araneae) in the tropical caves of Baratang Island, Andaman and

- Nicobar Islands, India. Journal of the Bombay Natural History Society 119(2). <https://doi.org/10.17087/jbnhs/2022/v119/160197>
- Kawalkar D, Manchi S (2020) Coastal caves on the Interview Island of Andaman Islands, India. Carbonates and Evaporites 35: 111. <https://doi.org/10.1007/s13146-020-00646-w>
- Kemp S (1924) Rhynchota of the Siju Cave, Garo Hills, Assam with description of a new species of reduviid. Records of the Indian Museum 26: 93–97.
- Kulkarni S, Ghate HV (2016) First record of the thread-legged assassin bug *Myiophanes greeni* Distant, 1903 (Heteroptera: Reduviidae: Emesinae) from India. Biodiversity Data Journal 4: e7949. <https://doi.org/10.3897/BDJ.4.e7949>
- Maldonado-Capriles J (1990) Systematic catalogue of the Reduviidae of the world (Insecta: Heteroptera). Caribbean Journal of Science, Special Publication 1, 694 pp.
- Manchi S, Mane A (2012) Conservation of the Edible-nest Swiftlet *Collocalia fuciphaga* in the Andaman and Nicobar Islands. Sálim Ali Centre for Ornithology and Natural History, Coimbatore, India.
- Manchi S, Sankaran R (2014) Protection of the White-nest Swiftlet (*Aerodramus fuciphagus*) in the Andaman Islands, India: an assessment. Oryx 48(2): 213–217. <https://doi.org/10.1017/S0030605311000603>
- Mane AM, Prabakaran N, Manchi SS (2019) Floral diversity, composition, and recruitment on the karstland of Baratang Island, India. Ecological Complexity 37: 47–54. <https://doi.org/10.1016/j.ecocom.2018.11.002>
- McAtee WL, Malloch JR (1926) Philippine and Malayan Ploiariinae (Hemiptera, Reduviidae). Philippine Journal of Science 30(1): 117–152.
- Mukherjee P, Chandra K, Hassan ME (2020) Catalogue of Reduviidae (Hemiptera) of India. Records of the Zoological Survey of India, Occasional Paper No. 401. Zoological Survey of India, Kolkata, 240 pp.
- Murthy RVR (2007) Andaman and Nicobar Islands: a geo-political and strategic perspective. Northern Book Centre, Delhi.
- Paiva CA (1919) Rhynchota from the Garo Hills, Assam. Records of the Indian Museum 16: 349–377. <https://doi.org/10.5962/bhl.part.25927>
- Pande P, Kothari A, Singh S (1991) Directory of national parks and sanctuaries in Andaman and Nicobar Islands: management status and profiles. Indian Institute of Public Administration, New Delhi.
- Ranasinghe T, Sankararaman H, Agarwal A, Sumanapala A, Ghate HV (2024) First record of *Bagauda aelleni* (Hemiptera: Reduviidae) from India and notes on its natural history in Sri Lanka. Zootaxa 5493(2): 153–164. <https://doi.org/10.11646/zootaxa.5493.2.4>
- Rédei D (2005) New and little-known thread-legged assassin bugs from Central and South Asia (Heteroptera: Reduviidae: Emesinae). Folia Entomologica Hungarica 66: 23–33.
- Reuter OM (1881) Ad cognitionem Reduviidarum mundi antiqui. – Helsingforsiae [= Helsinki], 71 pp. [preprint of article in Acta Societatis Scientiarum Fennicae 12 [1883]: 269–339]
- Sankaran R (2001) The status and conservation of the Edible-nest Swiftlet in the Andaman and Nicobar Islands. Biological Conservation 97: 283–294. [https://doi.org/10.1016/S0006-3207\(00\)00124-5](https://doi.org/10.1016/S0006-3207(00)00124-5)

- Sankararaman H, Ranasinghe T, Agarwal A, Sumanapala A, Ghate HV (2024) First report of an assassin bug of the genus *Ademula* McAtee & Malloch (Reduviidae: Emesinae) from India and its rediscovery from Sri Lanka. *Journal of Threatened Taxa* 16(9): 25894–25903. <https://doi.org/10.11609/jott.9088.16.9.25894-25903>
- Schuh RT, Weirauch C (2020) *True Bugs of the World (Hemiptera: Heteroptera): Classification and Natural History*. 2nd edn. Siri Scientific Press, Monograph Series 8, 767 pp.
- Wang TW, Rédei D (2022) First record of *Myiophanes tipulina* from Taiwan (Hemiptera: Heteroptera: Reduviidae). *Folia Entomologica Hungarica* 83: 101–108. <https://doi.org/10.17112/FoliaEntHung.2022.83.101>
- Wygodzinsky P (1966) A monograph of the Emesinae (Reduviidae, Hemiptera). *Bulletin of the American Museum of Natural History* 133: 1–614.